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May 18, 2004

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OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT  
APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A  
FILING DATE.

APPLICATION NUMBER: 10/406,336

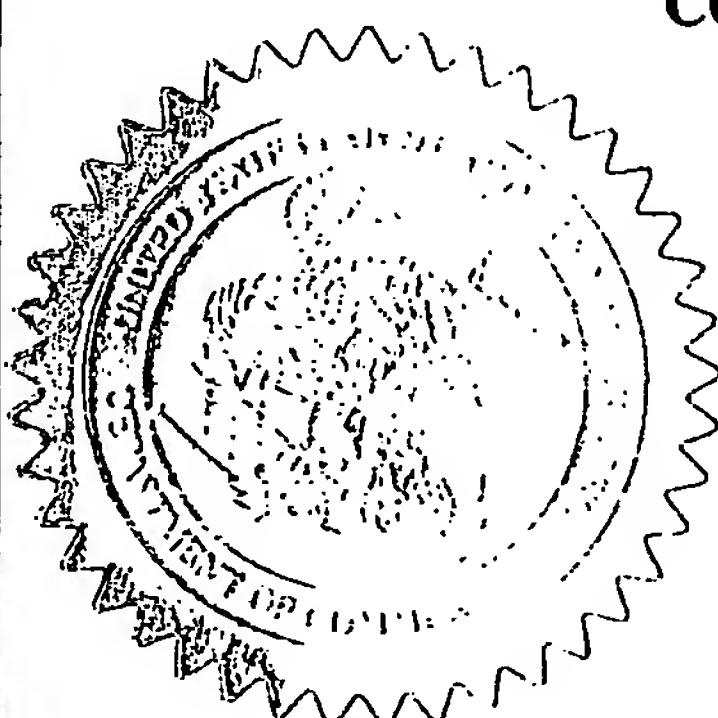
FILING DATE: April 03, 2003

RELATED PCT APPLICATION NUMBER: PCT/US04/09471

By Authority of the  
COMMISSIONER OF PATENTS AND TRADEMARKS



T. LAWRENCE  
Certifying Officer



PRIORITY DOCUMENT  
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04/03/03  
JC901 U.S.  
PTO

64-04-03  
3.7336-0303

PTO/SB/05 (03-01)

Approved for use through 10/31/2002. OMB 0651-0032  
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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## UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.

First Inventor

Title

Express Mail Label No.

Glenn Wakefield

Magnetically Propelled Capsule Endoscopy

E188230355US

### APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

- Fee Transmittal Form (e.g., PTO/SB/17)  
*Submit an original and a duplicate for fee processing*
- Applicant claims small entity status.  
See 37 CFR 1.27.
- Specification [Total Pages   ]
  - Descriptive title of the invention
  - Cross Reference to Related Applications
  - Statement Regarding Fed sponsored R & D
  - Reference to sequence listing, a table, or a computer program listing appendix
  - Background of the Invention
  - Brief Summary of the Invention
  - Brief Description of the Drawings (if filed)
  - Detailed Description
  - Claim(s)
  - Abstract of the Disclosure
- Drawing(s) (35 U.S.C. 113) [ Total Sheets    ]
- Oath or Declaration [ Total Pages    ]
  - Newly executed (original or copy)
   
Copy from a prior application (37 CFR 1.63 (d))
   
*(for continuation/divisional with Box 18 completed)*
    - DELETION OF INVENTOR(S)**
  
Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).
  -
- Application Data Sheet. See 37 CFR 1.76

ADDRESS TO: Assistant Commissioner for Patents  
Box Patent Application  
Washington, DC 20231

7.  CD-ROM or CD-R in duplicate, large table or Computer Program (Appendix)
8. Nucleotide and/or Amino Acid Sequence Submission (if applicable, all necessary)
  - a.  Computer Readable Form (CRF)
  - b. Specification Sequence Listing on:
    - i.  CD-ROM or CD-R (2 copies); or
    - ii.  paper
  - c.  Statements verifying identity of above copies

### ACCOMPANYING APPLICATION PARTS

9.  Assignment Papers (cover sheet & document(s))
10.  37 CFR 3.73(b) Statement  Power of Attorney (when there is an assignee)
11.  English Translation Document (if applicable)
12.  Information Disclosure Statement (IDS)/PTO-1449  Copies of IDS Citations
13.  Preliminary Amendment
14.  Return Receipt Postcard (MPEP 503) (Should be specifically itemized)
15.  Certified Copy of Priority Document(s) (if foreign priority is claimed)
16.  Nonpublication Request under 35 U.S.C. 122 (b)(2)(B)(i). Applicant must attach form PTO/SB/35 or its equivalent.
17.  Other: \_\_\_\_\_

18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment, or in an Application Data Sheet under 37 CFR 1.76:

Continuation     Divisional     Continuation-In-part (CIP)

of prior application No. \_\_\_\_\_

Prior application information: Examiner \_\_\_\_\_

Group A1 Unit: \_\_\_\_\_

For CONTINUATION OR DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 5b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

### 19. CORRESPONDENCE ADDRESS

<input type="checkbox"/> Customer Number or Bar Code Label				<input type="checkbox"/> Correspondence address below
Name	Glenn Wakefield			
Address	1416 East Carmen Street			
City	Tempe	State	AZ	Zip Code 85283
Country	USA	Telephone	480-839-7094	Fax

Name (Print/Type)	Glenn Wakefield	Registration No. (Attorney/Agent)	
Signature	Glenn Wakefield	Date	04/03/2003

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<b>FEE TRANSMITTAL</b>		<b>Complete if Known</b>	
<b>for FY 2003</b>		Application Number	
Effective 01/01/2003. Patent fees are subject to annual revision.		Filing Date	
<input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27		First Named Inventor	<i>Glenn Wakefield</i>
TOTAL AMOUNT OF PAYMENT	(\$)	Examiner Name	
		Art Unit	
		Attorney Docket No.	

<b>METHOD OF PAYMENT (check all that apply)</b>		<b>FEES CALCULATION (continued)</b>																																	
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SUBTOTAL (3) (\$)																																			

<b>SUBMITTED BY</b>		(Complete if applicable)	
Name (Print/Type)	<i>Glenn Wakefield</i>	Registration No. (Attorney/Agent)	
Signature	<i>Glenn Wakefield</i>	Telephone	<i>480-839-7094</i>
Date	<i>04/03/2003</i>		

**WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**

This collection of information is required by 37 CFR 1.17 and 1.27. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, Washington, DC 20231.

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**TITLE OF INVENTION**

Magnetically Propelled Capsule Endoscopy

**CROSS-REFERENCE TO RELATED APPLICATIONS**

Not Applicable

**STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT**

Not Applicable

**REFERENCE TO SEQUENCE LISTING, A TABLE, OR A COMPUTER PROGRAM LISTING COMPACT DISC APPENDIX**

Not Applicable

**BACKGROUND OF THE INVENTION**

This patent application applies to the field of medical imaging and tissue biopsy/excision.

Traditionally the digestive tract has been examined by the upper gastrointestinal endoscope and the lower gastrointestinal endoscope and most recently by the capsule endoscope. Upper and lower gastrointestinal endoscopy usually require an anesthetic and are limited by the inability to examine the small intestine. Capsule endoscopy does not practically allow for real time imaging and precludes tissue biopsy/excision. The upper and lower gastrointestinal endoscopy and capsule endoscopy provide a limited range of viewing/access angles.

**BRIEF SUMMARY OF THE INVENTION**

Magnetically propelled capsule endoscopy provides for the medical examination of the gastrointestinal tract. After the capsule is swallowed, it will be steered throughout the gastrointestinal tract by an externally generated magnetic field. This device will provide real time imagery and position data along with the ability to perform tissue biopsy/excision. This device can be applied to the gastrointestinal tract, reproductive tract, trachea/lungs, vascular system or any accessible body cavity.

**BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING**

Not Applicable

**DETAILED DESCRIPTION OF THE INVENTION**

Magnetically propelled capsule endoscopy allows for a fast, comprehensive medical examination of the digestive tract, reproductive tract, trachea/lungs, vascular system or any accessible body cavity. The capsule is swallowed or appropriately placed in the body. Contained within the small capsule will be:

(#1 possibility) - magnets for movement and directional control; LEDs for lighting and camera for visualization; rf source and receiver to transmit pictures and to communicate;

gyroscope/accelerometer for positional information; mechanical equipment for tissue biopsy/excision or other procedures; power source; electronics;

(#2 possibility) - magnets for movement and directional control; fiber optic light source, fiber optic imaging lens, power lines, communication lines, air hose, and water hose extending out the back of the capsule and connecting to the external control instrument; gyroscope/accelerometer for positional information; mechanical equipment for tissue biopsy/excision or other procedures; electronics.

All of the parts in #1 possibility and #2 possibility, other than the magnets, will be composed of nonmagnetic material or magnetically shielded as required. The #1 possibility is a capsule with no physical connection to the outside in contrast to the #2 possibility that is a capsule that has a physical connection to the outside. The choice of physical connection or not, capsule size and capabilities will vary depending on the part of the body that is being examined by the medical practitioner.

The magnets contained within the capsule will be bathed in an externally generated magnetic field. The external field is created by inscribing six metal rings on the six faces of an imaginary cube. Current is running through each of the six rings which effectively allows a pair of rings to control each dimension. The metal rings are composed of many windings of appropriately coated wire. The patient undergoing the medical examination will be placed inside the six ringed

structure. The capsule will be moved by appropriately changing the current within each ring. As necessary, the actual rings will be moved in conjunction with the changing current. The medical practitioner, using visual feedback, will guide the capsule throughout the body part under examination. The magnetic field strength will be adjusted appropriately for direction change, movement or extra stationary stability for tissue biopsy/excision or other procedures.

The gyroscope/accelerometer will provide the ability to map in real time the positional progress of the capsule. A positional map will be created of the entire exam, areas of interest can be marked, and visual images will be generated corresponding to each positional location of the capsule. A computer generated three dimensional fly through can be created based on the data collected from the examination. All of this data can be appropriately stored for future reference and for comparison with other medical exams.

## CLAIMS

I claim:

1. Magnetically propelled capsule endoscopy allows for a fast, comprehensive medical examination of the digestive tract, reproductive tract, trachea/lungs, vascular system or any accessible body cavity. The capsule is swallowed or appropriately placed in the body. Contained within the small capsule will be:

(#1 possibility) - magnets for movement and directional control; LEDs for lighting and camera for visualization; rf source and receiver to transmit pictures and to communicate; gyroscope/accelerometer for positional information; mechanical equipment for tissue biopsy/excision or other procedures; power source; electronics;

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#### ABSTRACT OF THE DISCLOSURE

Magnetically propelled capsule endoscopy provides for the medical examination of the gastrointestinal tract. After the capsule is swallowed, it will be steered throughout the gastrointestinal tract by an externally generated magnetic field. This device will provide real time imagery and position along with the ability to perform tissue biopsy/excision. This device can be applied to the gastrointestinal tract, reproductive tract, trachea/lungs, vascular system or any accessible body cavity.

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**DECLARATION FOR UTILITY OR  
DESIGN  
PATENT APPLICATION  
(37 CFR 1.63)**

Declaration Submitted with Initial Filing

OR

Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (e)) required)

Attorney Docket Number

First Named Inventor

Glenn Wakefield

COMPLETE IF KNOWN

Application Number

Filing Date

Art Unit

Examiner Name

As the below named inventor, I hereby declare that:

My residence, mailing address, and citizenship are as stated below next to my name.

I believe I am the original and first inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Magnetically Propelled Capsule Endoscopy

(Title of the Invention)

the specification of which

is attached hereto

OR

was filed on (MM/DD/YYYY)

as United States Application Number or PCT International

Application Number

and was amended on (MM/DD/YYYY)

(if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT International application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached? YES	Certified Copy Attached? NO
			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

[Page 1 of 2]

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PTO/SB/01 (10-01)

Approved for use through 10/31/2002, OMB 0651-0032

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**DECLARATION — Utility or Design Patent Application**

Direct all correspondence to:  Customer Number  
 or Bar Code Label  Correspondence address below

Name Glenn Wakefield  
 Address 1416 East Carmen Street  
 City Tempe State AZ ZIP 85283  
 Country USA Telephone 480-839-7094 Fax

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

NAME OF SOLE OR FIRST INVENTOR:  A petition has been filed for this unsigned inventor

Given Name (first and middle [if any]) <u>Glenn Mark</u>	Family Name or Surname <u>Wakefield</u>		
Inventor's Signature <u>Glenn Mark Wakefield</u>	Date <u>04/03/2003</u>		
Residence: City <u>Tempe</u>	State <u>AZ</u>	Country <u>USA</u>	Citizenship <u>USA</u>

Mailing Address 1416 East Carmen Street  
 City Tempe State AZ ZIP 85283 Country USA

NAME OF SECOND INVENTOR:  A petition has been filed for this unsigned inventor

Given Name (first and middle [if any])	Family Name or Surname		
Inventor's Signature	Date		
Residence: City	State	Country	Citizenship
Mailing Address			
City	State	ZIP	Country

Additional inventors are being named on the \_\_\_\_\_ supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto.